REMARKS:

1) In view of the accompanying Request for Continued Examination (RCE), the Final status of the Office Action of October 13, 2009 shall be withdrawn, and the examination shall be continued on the basis of the present amended claims and remarks.

2) The specification has been amended at page 11 to clarify and emphasize certain features of the invention. The inventive apparatus preferably includes shear-cutting edges 12 and a counter-cutting edge 13 that cooperate with each other so as to shear-cut any particles of the conveyed material that might come between the counter-cutting edge 13 and the shear-cutting edges 12. These features of the invention are supported by the original disclosure at page 11 lines 4 to 19, page 14 lines 10 to 12, claim 6, and drawing Fig. 2. Thus, the clarifications in the amendment at page 11 do not introduce any new matter. Entry thereof is respectfully requested.

3) The claims have been amended as follows. Independent claims 1 and 20 have been amended to recite additional features regarding the axial blow-through arrangement and the shear-cutting edges and the counter-cutting edge, as supported by prior claims 6, 24 and 25, the specification at page 11 lines 7 to 19 and page 14 lines 5 to 16, and drawing Fig. 2. Dependent claims have been amended wherever necessary for proper conformance with the amended independent claims. Claim 24 has been canceled. In view of the abovementioned original support, the present claim

amendments do not introduce any new matter. Entry and consideration thereof are respectfully requested.

4) Before particularly addressing the prior art rejections and comparing the present claims to the prior art disclosures, the invention will first be discussed in general terms to provide a background.

Applicant's discussion of the invention and the distinctions of the invention relative to the prior art references as set forth in the prior Response of July 8, 2009 are incorporated herein by reference and reasserted as to those references still being applied in the present Office Action.

The present invention involves an axial blow-through cellular wheel sluice or feeder for conveying or dosing a particulate material. This cellular wheel sluice or feeder includes a cellular wheel with cellular wheel webs to form respective dosing chambers within a cylindrical portion of a feeder housing. An injector nozzle blows a stream of transport gas through a blow-in hole, axially through one of the dosing chambers, and then out through a blow-out hole on the opposite side, in an axial blowing transport direction parallel to the rotation axis of the cellular wheel. The transport gas carries the particulate material out of the sluice or feeder in an axial direction. As previously discussed, that is a significant distinction relative to prior art cellular wheel feeders that do not use an axial blow-through arrangement but rather provide a rotary airlock in which particulate material is transferred gravitationally (i.e. simply falling) downwardly through the

device from an input port on the upper radial side to an output port on the lower radial side of the cylindrical housing arranged with its central axis extending horizontally. Such a rotary airlock operates basically in the manner of a typical revolving door, and does not have the same issues and considerations regarding a pressurized transport gas being blown axially through the dosing chambers.

Another important feature of the invention is that the gap seals arranged at radially outer edges of the cellular wheel webs purposely leave a radial spacing gap between each one of the gap seals and the cylindrical wall of the housing. As previously discussed, that is a significant distinction relative to prior art cellular wheel feeders in which the radial wheel webs purposely contact and wipe along the cylindrical wall of the housing to form a tight seal and thereby prevent leakage of the pressurized axial transport gas.

A third important distinguishing feature of the present invention is that the injector nozzle, axially blowing a stream of transport gas through the sluice or feeder, produces a reduced pressure within the dosing chamber which limits or prevents the leakage of the blown-in transport gas through the radial spacing gaps between the gap seals and the cylindrical wall of the housing. So, while prior art arrangements typically use a contacting seal to prevent gas leakage, the present invention purposely provides a radial spacing gap and uses a reduced pressure generated by the injector nozzle to prevent gas leakage past the radially outer ends of the cellular wheel webs. The above features were discussed in the previous Response.

In the present amendment, independent claims 1 and 20 now additionally recite that the radially outer edges of the gap seals of the cellular wheel webs are configured as respective shear-cutting edges that cooperate with a counter-cutting edge arranged in the supply chute at a circumferentially downstream side of the supply chute. The shear-cutting edges are oriented facing circumferentially forward in a rotation direction of the cellular wheel, and the counter-cutting edge is oriented circumferentially opposite the shear-cutting edges. The cutting edges are arranged so as to cooperate with one another to shear-cut particles of the conveyed particulate material between the counter-cutting edge and the shear-cutting edges. Such an arrangement is exemplified in the example embodiment shown in Fig. 2, with the shear-cutting edges 12 cooperating with the counter-cutting edge 13.

So, on the one hand, the radially outer ends of the cellular wheel webs (i.e. the gap seals) purposely leave a radial spacing gap relative to the cylindrical wall of the housing. On the other hand, these edge seals are further configured as respective shear-cutting edges that cooperate with a counter-cutting edge so as to shear-cut particles of the particulate material being conveyed. This combination of features prevents particles of the particulate material from becoming trapped between the radially outer ends of the cellular wheel webs (i.e. the edge seals) and the cylindrical wall of the sluice housing. If a material particle would be positioned on the radially outer edge of a cellular wheel web, whereby the particle might become trapped as mentioned above, then such a particle is shear-cut by the

cooperation of the shear-cutting edge with the counter-cutting edge at the downstream side of the supply chute, thereby preventing the particle from becoming trapped. Such a combination of features is not disclosed and would not have been suggested by the prior art.

5) Referring to section 4 on pages 2 to 6 of the Office Action, the rejection of claims 1, 2, 10 to 12, 17, 19 to 21 and 24 as obvious over US Patent 4,978,252 (Sperber) in view of US Patent 4,844,101 (Hirsch et al.) and further in view of US Patent 3,913,800 (Logan) is respectfully traversed.

Independent claims 1 and 20 have each been amended to incorporate subject matter from prior claims 24 and 25, which was not subject to the present rejection. The three applied references do not disclose and would not have suggested the arrangement of a counter-cutting member with a counter-cutting edge to cooperate with a shear-cutting edge, as acknowledged by the Examiner.

Furthermore, the three applied references do not even disclose or suggest the arrangement of shear-cutting edges on the radially outer ends of the radially extending cellular wheal webs in the first place. In this regard (with respect to prior claim 24), the Examiner asserted that the disclosure of "blades 30" by Logan suggests constructing the gap seals as cutting edges. The Examiner's assertion is respectfully traversed. <u>The term "blade" does not inherently and necessarily require a cutting edge</u>. For example, while a knife blade might have a cutting edge, an electrical terminal blade, a fan blade, a leaf blade, a bulldozer

blade, etc. do not have cutting edges. To the contrary, a person of ordinary skill in the art understands that a "cutting edge" must be sufficiently sharp to carry out a cutting operation, and that is not required by the term "blade" by itself.

The Logan reference does not suggest that the "blades 30" should have a sharp radially outer edge capable of cutting. To the contrary, Logan specifically requires that the radially outer end of the "blade" must be at least as wide as the radial wall (see abstract), so as to provide a relatively wide circumferential sealing surface 32, whereby the circumferential width T of the sealing surface 32 must be sufficiently large to establish a controlled laminar flow of the escaping gas past this sealing surface (col. 2 lines 55 to 68). Logan does not provide any disclosure or any suggestion that the radially outer end of the "blade" should be sharp so as to present a cutting edge, but instead to the contrary discloses that the radially outer end of the blade must have a relatively broad sealing surface 32.

Furthermore, Logan does not provide a counter-cutting edge to cooperate with the radially outer ends of the blades 30. In Fig. 1, note that the bottom edge of the left side of the inlet port is rounded and flared toward the left, which is directly contrary to the provision of a counter-cutting edge. In Fig. 2 note that the upper or clockwise edge of the radially outer sealing surface of the blade is curved inwardly relative to the lower or counterclockwise edge, which would prevent this edge from cooperating in a shear-cutting manner with a counter-cutting edge.

The Examiner has tacitly acknowledged that Sperber and Hirsch et al. do not disclose or suggest a cooperating arrangement of a shear-cutting edge and a counter-cutting edge. Thus, even a combined consideration of all three references would have provided no suggestion toward the above inventive features, because none of the references provide suggestions in this regard.

Still further, only Sperber and Hirsch et al. relate to axial blow-through feeders of the type according to the present invention. Both of these pertinent references purposely seal the housing to prevent or minimize leakage of the axially blown-in transport gas, for example by equipping the radially outer ends of the radial blades or vanes with seal members that contact and seal against the inner wall surface of the cylindrical housing. The Logan apparatus is not directly pertinent, because it does not involve the axial injection of a transport gas, but rather simply involves the gravity-driven "falling" of particulate matter radially or diametrically through a rotary airlock in the manner of a revolving door. Such a rotary airlock does not have the same pressure considerations as an axial blow-through feeder like the present invention because there is no axially injected pressurized transport gas. Thus, there is expected to be less need for pressure-sealing in the rotary airlock of Logan than in the axial blow-through feeders of Sperber or Hirsch et al. or the present invention. Only Logan purposely provides a radial gap between the radially outer ends of the blades and the cylindrical wall surface. While such a gap may have been suitable in a rotary airlock with gravity drop feed, it would not have been

expected to be suitable in an axial blow-through feeder like that of the present invention, in view of the contrary teachings of Sperber and Hirsch et al. relating to such an axial blow-through feeder. Thus, a person of ordinary skill in the art would not have been enabled or motivated, and would not have had a reasonable expectation of successfully achieving a predictable result, to pursue the combination and modification as now proposed by the Examiner as a reconstruction of the present invention.

For these reasons, the Examiner is respectfully requested to withdraw the obviousness rejection applying Sperber in view of Hirsch et al. and Logan.

6) Referring to section 5 on pages 6 to 8 of the Office Action, the rejection of claims 13, 16 and 25 as obvious over Sperber in view of Hirsch et al. and Logan and further in view of US Patent 4,268,205 (Vacca et al.) is respectfully traversed.

Currently amended independent claims 1 and 20 now incorporate subject matter from prior claims 24 and 25 as discussed above. The independent claims have been discussed above in comparison to the combination of Sperber, Hirsch et al. and Logan.

The Examiner has further applied Vacca et al. for disclosing an alleged counter-cutting member (54, col. 5 lines 29 to 31) attached to a side wall of a chute. However, element "54" cited by the Examiner is "a thin sheet 54 of high velocity air" according to Vacca et al. (col. 5 line 32). A thin sheet of high velocity air is not the same as, or suggestive of, a cutting edge

of a counter cutting member. While the apparatus of Vacca et al. includes an air nozzle 17 formed by two flat plates 55 and 56, that air nozzle 17 also does not form a counter-cutting edge, because it does not cooperate with shear-cutting edges of rotary vanes of the rotor. Instead, it can be seen that there is a significant spacing distance between the nozzle plates 17, 55, 56 and the radially outer end of the radial vanes to allow passage of the air jet or sheet 54 (see Fig. 1).

Furthermore, Vacca et al. would not have suggested the provision of a cooperating arrangement of shear-cutting edges with a counter-cutting edge, because Vacca et al. provide much different measures to avoid the problem of entrapping or pinching particles between the rotating blades and the cylindrical housing wall. Particularly, Vacca et al. provide an air nozzle 17 to blow a jet or sheet of high velocity air 54 over the radially outer ends of the radial vanes to blow away any particles of the conveyed material that might be clinging to the radially outer ends of the radial vanes (see col. 1 lines 50 to 53, col. 2 lines 28 to 56, col. 5 lines 25 to col. 6 line 52). Alternatively, Vacca et al. provide a flexible plastic wiper 82 or a brush to wipe any particles away from the ends of the radial vanes (Fig. 6, col. 7 lines 1 to 11). Therefore, Vacca et al. would not suggest cooperating cutting edges to shear-cut entrapped particles, because instead they aim to blow, wipe or brush any particles away from the ends of the radial vanes. Still further, to prevent particles from clinging to the radially outer ends of the vanes, Vacca et al. purposely provide a rounded leading edge 36 on the radially outer end of each vane (col. 4 lines 42 to 45,

col. 6 lines 26 to 40, col. 7 lines 5 to 11). Thus, the actual teachings of Vacca et al. are contrary to any suggestion or motivation to provide cooperating cutting edges for cutting particles on the radially outer ends of the vanes, because the motivation is to blow, wipe or brush away the particles.

Still further, as mentioned above, the apparatus of Vacca et al. is not an axial blow-through cellular wheel feeder like the present invention or like the apparatuses of Sperber or Hirsch et al., but rather it is simply a rotary air lock in the manner of a typical revolving door similar to the apparatus of Logan. Because the operational pressure conditions and material conveying conditions are significantly different in an axial blow-through cellular sluice relative to a simple gravity-drop rotary airlock, the teachings of the latter type of apparatus would not be expected to directly apply to the former type of apparatus.

Because the above discussed first three references (Sperber, Hirsch et al., and Logan) have been acknowledged as failing to disclose or suggest the features of claim 25 as discussed above, therefore even a combined consideration with Vacca et al. would not have suggested the present invention. Namely, the first three references do not suggest the cooperative arrangement of a counter-cutting edge and shear-cutting edges, and the teachings of Vacca et al. are actually contrary to such an arrangement. For these reasons, the Examiner is respectfully requested to withdraw the obviousness rejection applying Sperber, Hirsch et al., Logan and Vacca et al.

7) Referring to section 6 on page 8 of the Office Action, the rejection of claims 14 and 26 as obvious over Sperber in view of Hirsch et al. and Logan, and further in view of US Patent 4,155,486 (Brown) is respectfully traversed. Claims 14 and 26 respectively depend from claims 1 and 20, which have been discussed above in comparison to Sperber in view of Hirsch et al. and Logan. The Examiner has additionally applied the Brown Patent for a wear liner made of wear-resistant material. However, Brown discloses a rotary feeder that is a rotary vane type airlock with diametrically opposed inlet and outlet ports, in the manner of a typical revolving door. Therefore the teachings of Brown do not relate directly to an axial blow-through feeder according to the present invention. Also, it is significant that the seal blades of Brown purposely contact the inner wall of the housing (see abstract), so that therefore it makes sense to provide a wear liner according to Brown. On the other hand, if the seal blades purposely do not contact the inner wall of the housing (e.g. according to the present invention), then the reason and purpose of Brown for providing the wear-resistant liner would no longer exist. Thus, the teachings and motivations of Brown would not have led to the modifications proposed by the Examiner, because those modifications would remove the purpose or motivation of Brown. Still further, Brown also would not have suggested the additional features of independent claims 1 and 20 as discussed above. Thus, even a combined consideration of all of the references would not have suggested the present invention. The Examiner is

respectfully requested to withdraw the obviousness rejection applying Sperber in view of Hirsch et al., Logan and Brown.

8) Referring to section 7 on pages 8 and 9 of the Office Action, the rejection of claims 15, 27 and 28 as obvious over Sperber in view of Hirsch et al. and Logan, and further in view of US Patent 4,906,144 (Matsueda) is respectfully traversed. Once again, the Matsueda reference does not relate to an axial blow-through feeder in the manner of the present invention, but rather relates to a rotary airlock feeder in the manner of a typical revolving door. Also once again, the seal blade tips of Matsueda purposely contact the inner wall of the cylindrical housing (see abstract). Thus, the pertinent teachings of Matsueda in this regard are directed away from the features of the present invention. Furthermore, even if a person of ordinary skill in the art would have been motivated to provide a helical configuration of the rotary vanes or blades, there still would have been no suggestion or motivation to provide shear-cutting edges on the radially outer ends of the vanes or blades in such a manner so that they leave a radial spacing gap relative to the cylindrical inner wall of the housing, while cooperating with a counter-cutting edge arranged in the supply chute. Instead, Matsueda teaches that the blades shall be in contact with the inner cylindrical surface of the casing or housing (see abstract). Thus, Matsueda provides no further suggestions in this regard that would have supplemented or modified the teachings of Sperber, Hirsch et al. and Logan as discussed above. For these reasons, the Examiner is respectfully

requested to withdraw the obviousness rejection applying Sperber in view of Hirsch et al., Logan and Matsueda.

9) Referring to section 8 on page 9 of the Office Action, the rejection of claims 18, 22 and 23 as obvious over Sperber in view of Hirsch et al. and Logan, and further in view of US Patent 5,725,332 (Harper et al.) is respectfully traversed. Claims 18, 22 and 23 depend from independent claims 1 or 20, which have been discussed above in comparison to Sperber, Hirsch et al. and Logan. The Examiner has additionally applied Harper et al. for disclosing a rotary feeder with a trapezoidal blow-out hole. Once again, it is significant that the apparatus of Harper et al. provides resilient seal strips on the radially outer ends of the rotary vanes or blades, to contact and seal against the inner wall of the cylindrical housing. Thus, the teachings of Harper et al. in this regard are also contrary to the present invention. The dependent claims 18, 22 and 23 are patentable already due to their dependence from claims 1 and 20. For these reasons, the Examiner is respectfully requested to withdraw the obviousness rejection applying Sperber in view of Hirsch et al., Logan and Harper et al.

10) Summarizing the disclosures of the several applied references, it is significant to recognize that only Sperber, Hirsch et al. and Harper et al. relate to axial blow-through feeders of the type according to the present invention. All three of these pertinent references purposely seal the housing to prevent or minimize leakage of the blown-in transport gas, for example by

equipping the radially outer ends of the radial blades or vanes with seal members that contact and seal against the inner wall surface of the cylindrical housing. The other references (Logan, Vacca et al., Brown, Matsueda) are not pertinent, because they do not involve the axial injection of a transport gas, but rather simply involve the gravity-driven "falling" of particulate matter radially or diametrically through a rotary airlock in the manner of a revolving door. Such a rotary airlock does not have the same pressure considerations as an axial blow-through feeder like the present invention because there is no axially injected pressurized transport gas. Thus, there is expected to be less need for pressure-sealing in the rotary airlock than in the axial blow-through feeder. It is significant that all of the pertinent axial blow-through feeders specifically refer to sealing the housing to prevent gas blow-by. Most of the radial airlocks (e.g. Brown, Matsueda) also provide seal blades in contact with the inner wall surface of the cylindrical housing, while only Logan purposely provides a radial gap between the radially outer ends of the blades and the cylindrical wall surface. While such a gap may have been suitable in a rotary airlock with gravity drop feed, it would not have been expected to be suitable in an axial blow-through feeder like that of the present invention, in view of the contrary teachings of Sperber, Hirsch et al. and Harper et al. relating to such an axial blow-through feeder. Still further, none of the references disclose or suggest the cooperation of cutting edges as now claimed, and the teachings of Vacca et al. would have led the ordinarily skilled artisan away from the present inventive solution to the same problem of

entrapment of particles of the conveyed material. Therefore, even a combined consideration of all of the references would not have suggested the present invention.

11) Referring to section 10 on page 10 of the Office Action, the additional prior art made of record requires no particular comments because it has not been applied against the claims.

12) Favorable reconsideration and allowance of the application, including all present claims 1, 2, 10 to 23 and 25 to 28, are respectfully requested.

Respectfully submitted,

WFF:ks/he/4959
Enclosures:
Transmittal Cover Sheet
Request for Continued Examination
Form PTO-2038

By _____
Walter F. Fasse
Patent Attorney
Reg. No.: 36132
Tel. 207-862-4671
Fax. 207-862-4681
P.O. Box 726
Hampden, ME 04444-0726

CERTIFICATE OF FAX TRANSMISSION:

I hereby certify that this correspondence with all indicated enclosures is being transmitted by telefax to (571) 273-8300 on the date indicated below, and is addressed to: COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450.

_____ 1/13/10
Name: Walter F. Fasse - Date: January 13, 2010